

1 **CLAIMS**

2 I claim:

3 1. A portal-based appliance system for ultraviolet disinfection (UV) of interior
4 surfaces and contents of containers, the system comprising a container having a housing
5 with at least one portal positioned on the housing of a container for receiving UV light
6 input into the container from a UV light source.

7 2. The UV system according to claim 1, wherein the portal is connectable to fiber
8 optic transmission lines.

9 3. The UV system according to claim 2, wherein the portal is a fiber optic
10 transmission line-ready portal.

11 4. The UV system according to claim 3, wherein the fiber optic transmission line-
12 ready portal includes a fiber optic transmission line fastener.

13 5. The UV system according to claim 1, wherein the portal includes an interface
14 device for providing protection to appliance components.

15 6. The UV system according to claim 5, wherein the interface device is UV-
16 transmissive.

17 7. The UV system according to claim 1, wherein the container is used for animal
18 housing.

19 8. The UV system according to claim 1, further including at least one portal optical
20 component positioned between the portal opening and the interior of the appliance.

21 9. The UV system according to claim 8, wherein the at least one portal optical
22 component is UV transmissive.

- 1 10. The UV system according to claim 8, wherein the at least one portal optical
- 2 component is UV reflective.
- 3 11. The UV system according to claim 8, wherein the at least one portal optical
- 4 component is selected from the group consisting of reflectors, shutters, lenses, splitters,
- 5 focalizers, mirrors, rigid and flexible light guides, homogenizer, mixing rods, manifolds,
- 6 couplers, filters, gratings, diffracters, color wheels, and combinations thereof.
- 7 12. The UV system according to claim 8, wherein the at least one portal optical
- 8 component includes at least one photocatalyst that degrades compounds contacting the
- 9 surface of the portal optic.
- 10 13. The UV system according to claim 12, wherein the at least one photocatalyst is
- 11 selected from the group consisting of TiO₂, WO₂, ZnO, ZnS, SnO₂, and PtTiO₂ and the
- 12 like.
- 13 14. The UV system according to claim 1, wherein the container is an appliance
- 14 selected from the group consisting of fluid-treatment appliances, fluid-dispensing
- 15 appliances, fluid-storage appliances, fluid-manufacturing appliances, and combinations
- 16 thereof.
- 17 15. The UV system according to claim 1, wherein the container is an individual use
- 18 container.
- 19 16. The UV system according to claim 15, wherein the container is a beverage
- 20 container.
- 21 17. The UV system according to claim 16, wherein the beverage container is selected
- 22 from the group consisting of water, coffee, tea, milk, juice, carbonated beverage, wine,
- 23 beer, and combinations thereof.

1 18. The UV system according to claim 15, wherein the container is a biological fluid
2 container.

3 19. The UV system according to claim 18, wherein the container is used to contain
4 blood, blood products, fermentation products, cell culture products, biotechnology
5 products, and combinations thereof.

6 20. A portal system for ultraviolet disinfection (UV) of appliances, the system
7 comprising at least one portal for receiving UV light input.

8 21. The UV system according to claim 20, wherein the portal is connectable to fiber
9 optic transmission lines.

10 22. The UV system according to claim 21, wherein the portal is a fiber optic
11 transmission line-ready portal.

12 23. The UV system according to claim 22, wherein the fiber optic transmission line-
13 ready portal includes a fiber optic transmission line fastener.

14 24. The UV system according to claim 20, wherein the portal includes an interface
15 device for providing protection to appliance components.

16 25. The UV system according to claim 24, wherein the interface device is UV-
17 transmissive.

18 26. The UV system according to claim 20, further including at least one portal optical
19 component positioned between the portal opening and the interior of the appliance.

20 27. The UV system according to claim 26, wherein the at least one portal optical
21 component is UV transmissive.

22 28. The UV system according to claim 26, wherein the at least one portal optical
23 component is UV reflective.

1 29. The UV system according to claim 26, wherein the at least one portal optical
2 component is selected from the group consisting of reflectors, shutters, lenses, splitters,
3 focalizers, mirrors, rigid and flexible light guides, homogenizer, mixing rods, manifolds,
4 couplers, filters, gratings, diffracters, color wheels, and combinations thereof.

5 30. The UV system according to claim 26, wherein the at least one portal optical
6 component includes at least one photocatalyst that degrades compounds contacting the
7 surface of the portal optic.

8 31. The UV system according to claim 30, wherein the at least one photocatalyst is
9 selected from the group consisting of TiO₂, WO₂, ZnO, ZnS, SnO₂, and PtTiO₂ and the
10 like.

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